

# TECHNOLOGY INTEGRATION FOR THE **NEW 21ST CENTURY LEARNER**

Today's students need educators  
to re-envision the role of  
technology in the classroom.

BY NANCYE BLAIR

**A DRAMATIC SHIFT** is sweeping through our schools. The signs are all around us. Third graders texting on their cell phones. Kindergarteners who can navigate an iPod Touch better than we can. Middle schoolers who already have an Internet following on their blog or YouTube channel.

These are not the same 21st century learners we came to know over the first decade of the new millennium. For these students, simply watching videos or images during class, playing an Internet multiplication game, or even taking turns at an interactive whiteboard is no longer enough.

These *new* 21st century learners are highly relational and demand quick access to new knowledge. More than that, they are capable of engaging in learning at a whole new level. With the world literally at their fingertips, today's students need teachers and administrators to re-envision the role of technology in the classroom.



Artwork by  
Reagan C., Karlee S.,  
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Elementary Academy.





## Technology Integration Remixed

The new 21st century learners must master more than the core curriculum to succeed in secondary and postsecondary institutions, as well as in the workplace. The Partnership for 21st Century Skills, a national organization advocating for 21st century readiness for every student, explains the outcomes of this transformation as fusing the traditional three R's with four C's: critical thinking, creativity, communication, and collaboration.

As students develop the four C's, we have discovered that effective application of these vital skills in a technology-infused life and workplace requires acquiring them in a technology-infused learning environment. This environment calls for two elements: We must increasingly put technology into the hands of students and must trust them with more progressive technology use.

It is no longer sufficient for students to have less access to technological tools than the teacher; nor is it enough for any one suite of software to serve as the zenith for technology mastery. For student performance to approximate student potential, students need access to a constantly evolving array of technological tools and activities that demand problem-solving, decision-making,

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teamwork, and innovation. The four C's are at the heart of the International Society for Technology in Education's National Educational Technology Standards (NETS) for Students, providing a substantial framework for defining the focus of technology objectives for K-12 students. For example, in implementing these standards we have found that even our youngest 21st century learners are capable of independently creating digital storybooks, artwork, presentations, and movies.

### Shift in Roles

Following the joyous moment when educators realize their students are capable, independent technology users who can create inspiring digital masterpieces, the next reaction is often a more solemn, "How do we fit it all in?" In fact, the answer to this question is vital to a successful technology integration transformation.

In the former mindset of teaching with technology, the teacher was the focal point of the classroom, creating (often time-consuming) interactive

and multimedia presentations to add shock and awe to his or her lessons and capture the attention of the 21st century child. A new mindset of teaching *through* technology must emerge, which depends on a vital shift in teacher/student roles.

In this configuration, the teacher acts as a learning catalyst, orchestrating and facilitating activities that spark defining moments for students. The most effective activities take two forms—discovery and creation—though they often symbiotically work together. The student then becomes the focal point of the classroom, acting as explorer (e.g., mathematician, scientist, sociologist) and designer (e.g., author, artist, composer).

This is a liberating shift. As teachers spend less time creating presentations and more time crafting powerful learning activities, they will find that material is covered with more depth and retention the first time around, saving them time and energy in the long run. Moreover, by allowing students to be explorers and designers, educators show that they believe in their students' abilities and validate each student's contribution to the class.

**Discovery and Exploration.** In technology-infused discovery activities, Internet research, virtual manipulatives, and multimedia resources allow students to explore unanswered questions. For example, instead of beginning a lesson on geometric transformations by listening to a lecture or looking at examples on the board, a fourth grader might use the free geometric transformation activities in Utah State University's National Library of Virtual Manipulatives ([nlvm.usu.edu](http://nlvm.usu.edu)) to answer a probing question such as "What is a geometric reflection?" Middle schoolers might take it a step further to discover and develop steps for graphing a reflection on a coordinate plane. Exploring as a real mathematician would, students try to understand, analyze, and evaluate their experience to answer the posed question.

Discovery activities give students real-world, problem-solving experience

## Principal ONLINE

Access the following Web Resources by visiting *Principal* magazine online: [www.naesp.org/JanFeb12](http://www.naesp.org/JanFeb12)

Discover resources and tutorials for Technology Integration and Student-Created Digital Media through the **author's blog**.

Learn more about implementing the International Society for Technology in Education's **National Educational Technology Standards (NETS)** for Students, Teachers, and Administrators.

Listen to Sugata Mitra share more about his research through his TED Talk titled "**The Child-Driven Education**."

Gain **technology integration** tips on the Edutopia website.



McKeel Elementary Academy students produce work for authentic audiences.

and ownership over their learning, as well as allow them to bring their observations into the subsequent lesson, discussion, or creation activity as prior knowledge.

**Creation and Design.** Likewise, creation activities provide students the ability to develop creativity and problem-solving skills by displaying their mastery in profound and meaningful ways. Teachers at McKeel Elementary Academy in Lakeland, Florida, integrate the use of technology for student-created digital media into all areas of curriculum:

- Kindergarteners create image-based movies on recycling and insects;
- First graders develop PowerPoint presentations for “My Time to Teach” projects to share with the class;
- Fourth graders prepare for their statewide standardized writing assessment by developing elaborate digital storybooks on free web 2.0 sites such as Storybird ([www.storybird.com](http://www.storybird.com)) or StoryJumper ([www.storyjumper.com](http://www.storyjumper.com)); and

- Fifth graders collaborate to launch a Web Safety Wiki to teach other students worldwide about digital citizenship ([wildcatwebsafety.wikispaces.com](http://wildcatwebsafety.wikispaces.com)).

The projects created are excellent tools for formative and summative assessment. Yet more than that, through creation activities, students design products that make them active partners in constructing learning experiences in the classroom and beyond. In demonstrating their skills and knowledge, they become more confident in their own abilities and their own voices.

### Authentic Audiences

One of the greatest benefits of 21st century technology infusion is also one of the key mandates for successful technology integration. Traditionally, students have composed their work for an audience of one—the teacher. By using technological resources to establish authentic audiences for student work, we tell students that their work is worth seeing, worth reading, and worth doing.

Authentic audiences come in many forms—class presentations, school news shows, school websites, film festivals, literary publications, online publishing through blogs or other web 2.0 tools, contests and competitions, and Skyping with other classes around the world.

Two years ago, several students at McKeel entered a Winter Story Competition sponsored by E2BN, using its Myths and Legends Story Creator ([myths.e2bn.org](http://myths.e2bn.org)). Having access to a dynamic digital storytelling tool and the promise of an international audience of students, McKeel students were motivated to write, enhance, and edit their stories—and it paid off. One fourth grader won the text-only competition; another was recognized as runner-up in the illustrated division.

Students from around the world who read these stories shared their feedback and congratulations through the site’s online commenting system. Among others, the runner-up student received this comment: “I read all the

stories in the contest and yours is the best! Be a writer when you grow up. You will be world wide!”

One comment like that can transform a student’s outlook on his or her education. As an International Story Contest runner-up at age 9, this creative young girl now plans to be a writer when she grows up.

Worldwide, students and teachers are discovering the benefits of global collaboration and the power of authentic audiences. For example, students at Lincoln Middle School in Santa Monica, California, share a collection of student-created math screencasts at **Mathtrain.TV**, which has received more than 350,000 views. The ThinkQuest Project Library ([www.thinkquest.org/library/](http://www.thinkquest.org/library/)) hosts more than 8,000 student-created websites designed by ThinkQuest competitors.

Through effective use of technology, every new 21st century learner can have the opportunity to learn from and publish to an eager global audience.

### A Device for Every Child?

With potential fingertip access to such incredible student opportunities on the line, principals and teachers have a great responsibility to innovatively harness the power of technological resources.

Ideally, to maximize these opportunities, every student needs direct access to technology on a daily basis. This means moving away from the days of visiting the computer lab toward a one-to-one initiative in the classroom. Unfortunately, with variable school budgets and technology resources, this often seems like a daunting task.

Easing the resource strain, affordable notebooks and handheld devices have become worthy supplements, or even replacements, for more expensive desktops or laptops. Combine that with the bounty of free educational web 2.0 sites and apps, as well as an increasing number of websites with fees that offer free access to educators and students (e.g., [www.xtranormal.com](http://www.xtranormal.com) and [www.wikispaces.com](http://www.wikispaces.com)), and it becomes much easier to provide classrooms with rich technological resources.





# What if...

## all the computers were broken?

By David Wells

**A**t the first meeting of a districtwide committee on integrating 21st century teaching and learning in our schools, I asked the committee members if they thought we could provide a 21st century education if all of our computers and devices suddenly broke. We thought about it for a moment and quickly agreed that you don't need computers to provide 21st century learning because the essential concepts hinge on teaching rather than technology alone.

### A TOOL, NOT A SOLUTION

Our school district, like most others across the nation, has invested heavily in providing students with technological resources. However, 21st century learning requires more than buying a set of computers, interactive whiteboards, and tablet computing devices. **Technological devices provide tremendous benefits to students, but they are not the backbone of 21st century learning.**

The Partnership for 21st Century Skills addresses using technology as a tool for research, organization, analysis, and communication, not as the main goal of 21st century learning. It is critical that we embrace the true definition of 21st century learning to ensure that teaching and learning is transformed.

### CASES IN POINT

So what does 21st century learning look like? How do we make sure our work is about student learning and not the dazzle of technological resources? While these questions can be difficult to answer, the response lies in sound student-centered pedagogy. Consider the following examples that include, but are not centered on, the use of technology.

**A fourth-grade teacher in Vermont seeks to build her students' understanding of global awareness.** While she could use a social studies textbook and encyclopedia to teach her students about diverse cultures, religions, and lifestyles, it would be

a static understanding. This teacher wants to make a real connection with students in Hawaii, so she uses a free video-conferencing technology such as Skype to host live meetings between the two groups of students. Both sets of students benefit from the video-conferencing session and are able to learn songs and dances in addition to basic facts about their two school communities.

**A sixth-grade teacher wants his students to examine character development and plot in a science fiction novel.** As an extension of traditional class discussions of the novel, the teacher has his students write "fan fiction" that extends the original novel. Sensing his students' pride in their work, the teacher embarks on a podcast project where students create their own audio retelling of their writing, complete with a music soundtrack and homemade sound effects. Using the free software program Audacity, the **students create a high-quality piece of authentic work that can be shared with the school**

**community.** Taking the project one step further, the students' podcast is shared with a class in another state and the two groups of students meet via Skype to discuss and critique the work.

**A third-grade teacher seeks to increase her students' reading comprehension skills.** She already has taken a "readers' workshop" approach to studying pieces of literature, but is still concerned that some students hold back in class discussion sessions. In an effort to enhance her students' participation, she uses Moodle, an online learning tool, to host class discussions of novels. By posting strategic questions, this teacher is able to encourage all of her students to participate in a genuine study of the novel. Not only does she see formerly reluctant students join the conversations, but she also is able to focus the discussion of her more advanced students in a way that was not always possible in a face-to-face class discussion.

All of these examples are primarily based on good teaching. A teacher builds her students' global awareness, another teacher engages his students in a project-based study of literature, and a third teacher builds on her students' communication skills. Any of these examples could have been realized without the use of technology, yet it played a key role in all three scenarios.

Twenty-first century learning can be realized even if all of our computers were broken, but we are fortunate to have these incredible tools at our disposal. Our task is to use these tools to deliver the education our students deserve.

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Moreover, though we should certainly strive for the ideal one-to-one computing environment, Sugata Mitra, professor of educational technology at Newcastle University, offers an alternative. Mitra shared on his blog ([sugatam.blogspot.com](http://sugatam.blogspot.com)) that "groups of children can learn to use computers and the Internet to answer almost any question ... All they need is free access and the liberty to work in unsupervised groups." In his research, in addition to astonishing information on retention rates, Mitra found the most effective group size to be four to five children and recommends a 1:4 ratio of computers to students.


This could mean a 75 percent savings in initial costs, especially if combined with technology centers and rotations in the classroom for independent work. As an added bonus, this collaborative structure is particularly conducive to transforming technology use from skill drills to teaching through discovery and creation activities.

### A Vision for the Future

**Developing a progressive technology-infused campus is not about money; it's about mindset.** To successfully implement such a program, a school must be led by a proactive leader who:

- Makes the needs of the new 21st century learner a priority;
- Deliberately empowers teachers to innovatively craft digital learning experiences that promote discovery and creation; and
- Establishes a shared vision and unique plan for their students and teachers.

So how can you start today? First, assemble a team of administrators, technology specialists, educators, parents, and students who can collaborate to


 **create a shared vision for 21st century learning.** The vision should establish not only ideals for technology-infusion in the classroom, but also a set of NETS-based progressive technology objectives that outline what and when technology skills will be introduced, developed, and

mastered by students. Additionally, the vision should account for the evolution of the program to sufficiently adapt to the emergent needs of learners.

Once you have crafted a common vision, this team can perform a needs assessment. Do you need to reallocate or obtain more hardware resources for classrooms? Do your teachers need training in transforming 21st century technology integration? Do you need to explore the array of web 2.0 resources to determine which are best suited for your educational environment? **One need that is often overlooked is the support of a designated person, perhaps a technology integration specialist or coach, to assist teachers as they implement technology uses in their classrooms.** The team can then analyze this information to create a unique plan to address the needs identified in the assessment.

With the vision and plan in place, **enlist a handful of innovative educators to pilot the use of new technology and methodology in their classrooms.** Encourage these early adopters to create a personal learning network (PLN) through online communities, such as Classroom 2.0 ([www.classroom20.com](http://www.classroom20.com)), The Educator's PLN ([edupln.ning.com](http://edupln.ning.com)), or Twitter's #EdChat discussions, to share and develop their skills and resources.

**In order to propagate the vision to all staff, parents, and students, have these educators share their experiences and expertise through school events as well as staff and in-service meetings. Most importantly, proudly broadcast the most valuable results of these innovators by showcasing student gains, discoveries, and creations.**

The new 21st century learners are sitting in your classrooms, ready to explore, design, and create. If you provide the resources and transform their mindsets, powerful and effective technology integration will follow. 

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